SONY®

High Performance Data Storage System

DIR-1000H

DMS-8800

PetaSite ™

Sony DIR-1000 Series Digital Data Recorders conform to the ANSI ID-1 standard (ANSI X3.175-1990), providing storage capacity of up to 96 GBytes on a single standard cassette, at user data rates from 1 MBytes/sec to 64 MBytes/sec. Offering user data rates of up to 32 MBytes/sec, the first three models in the series have been accepted around the world in a growing range of instrumentation recording and mass storage applications. The latest model, the DIR-1000H, provides a maximum rate of 64 MBytes/sec (512 MBits/sec), the fastest data rate within the DIR-1000 Series.

In response to unprecedented demand for data storage from the ever growing community of users of high-performance computer systems, Sony has continued to develop its range of high-performance data storage solutions to meet a variety of applications for both instrumentation and computer mass storage. We offer a wide selection of system interface products, including a SCSI-2 Fast/Wide controller.

Our selection of mass storage solutions has recently been extended by the addition of the DMS-8800 PetaSite Series, which offers capacities from 6.8 terabytes to 3 petabytes — a true flagship system for digital mass storage applications.

Up to 32 MBy

DIR-1000

All DIR Series Models are compatible with each other

Up to 64 MBytes/sec

DIR-1000H

...ytes/sec

Up to 16 MBytes/sec

DIR-1000M

Up to 8 MBytes/sec
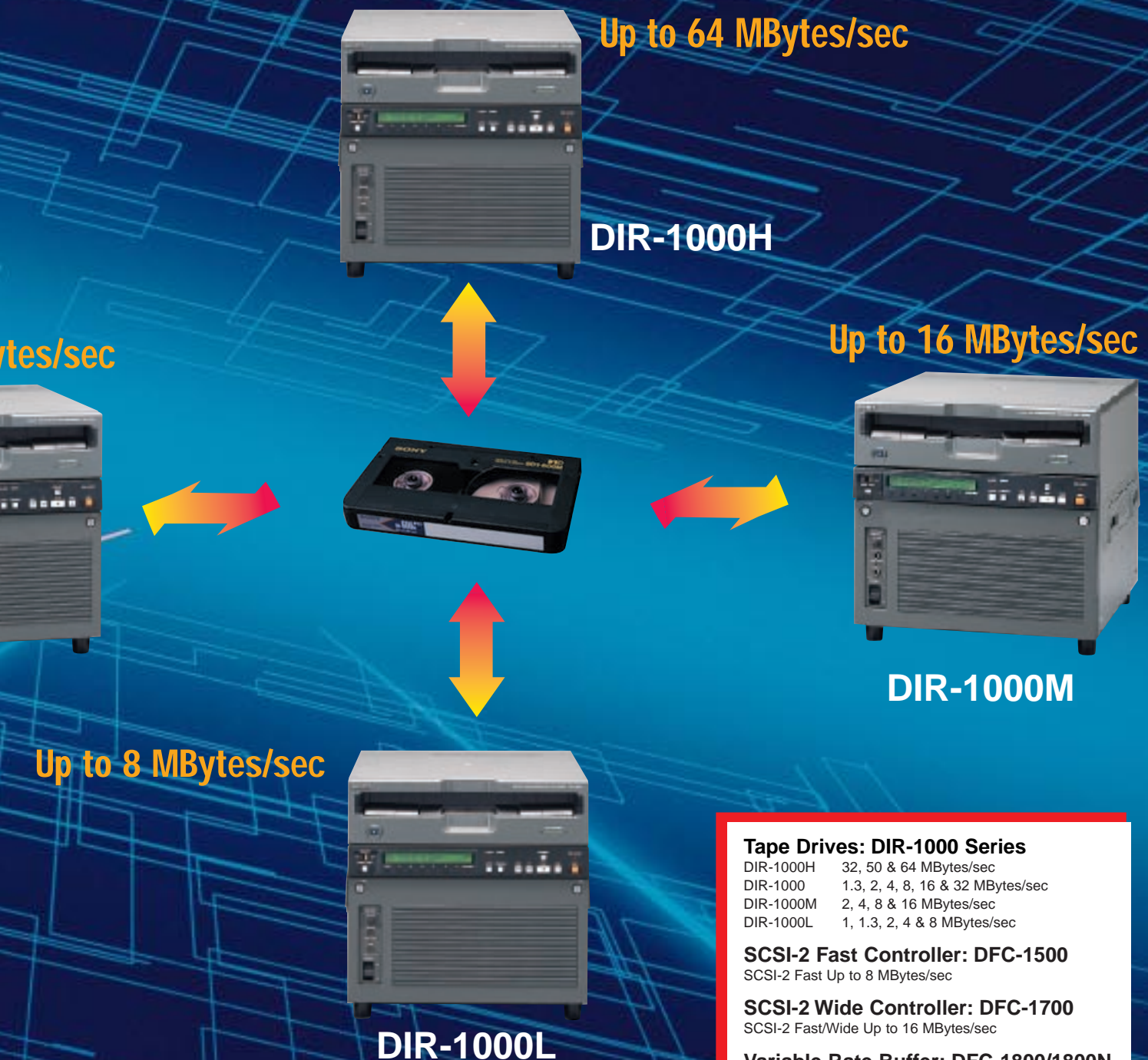
DIR-1000L

Tape Drives: DIR-1000 Series
DIR-1000H   32, 50 & 64 MBytes/sec
DIR-1000   1.3, 2, 4, 8, 16 & 32 MBytes/sec
DIR-1000M   2, 4, 8 & 16 MBytes/sec
DIR-1000L   1, 1.3, 2, 4 & 8 MBytes/sec

SCSI-2 Fast Controller: DFC-1500
SCSI-2 Fast Up to 8 MBytes/sec

SCSI-2 Wide Controller: DFC-1700
SCSI-2 Fast/Wide Up to 16 MBytes/sec

Variable Rate Buffer: DFC-1800/1800N
Real time data acquisition 0 to 128 Mbits/sec

Cassette Automation: DMS Series
DMS-8800   6.8 TBytes to 3 PBytes
DMS-24   1.5 to 2.3 TBytes

Recording Media: SD1 Series
SD1-600M   43 GBytes/cassette
SD1-1300L   96 GBytes/cassette

DIR-1000 Series
Digital Data Recorders

The DIR-1000 Series data recorder conforms to the ANSI (American National Standard Institute) X3.175-1990 ID-1 format. Standardized in 1990, the ID-1 format is based broadly on technology developed for professional broadcast video a market in which Sony products are widely recognized the world over. The on-tape footprint described by the ID-1 format is shown in Fig. 1. The ID-1 format utilizes azimuth recording techniques whereby adjacent helical tracks are recorded at different azimuth angles to minimize the effects of miss-tracking for greater reliability on interchange. Data recorded on each track on tape is processed by two Reed-Solomon product code arrays. The data is interleaved within the track to minimize the effects of larger dropouts. After correction, a bit error rate of better than 1×10^{-10} (1×10^{-13} with retry) is achieved.

The control track is primarily used as an off-tape reference for the servo system during replay. In the case of the ID-1 format, it also contains a 23-bit binary address for each set of four helical tracks which serves to identify individual track sets on the tape. The system enables individual track-sets to be quickly located as the longitudinal tracks are read at all tape speeds including Rewind and Fast Forward.

In addition, two longitudinal tracks are recorded with AC bias as annotation channels. These are provided to record auxiliary information such as voice comments and time code. Annotation Channel 1 can be used to record and play back voice comments through microphone and headphone jacks located on the front panel.

Fig.1
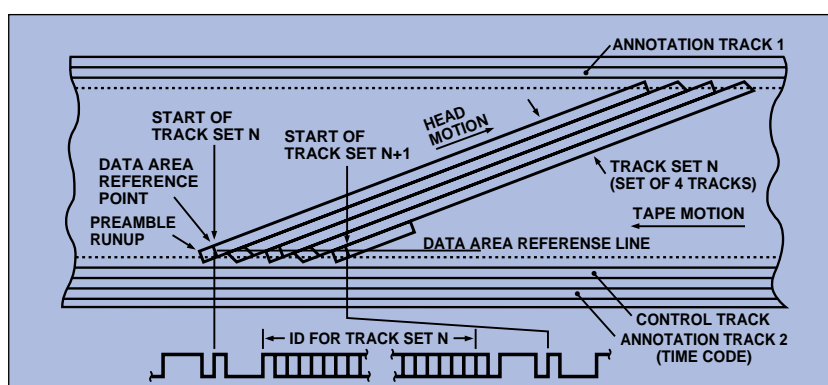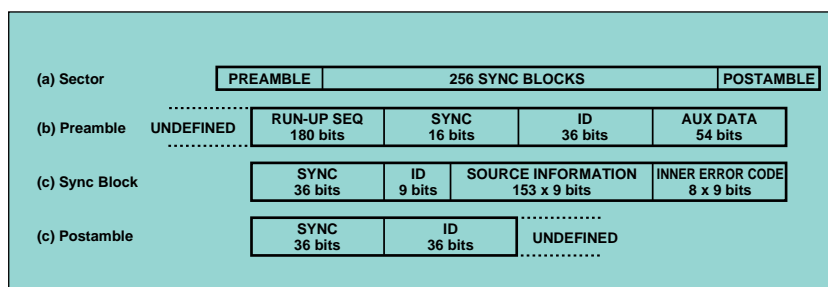**The ANSI ID-1 Format Tape Footprint**

Fig.2 Helical Data

High-Density Recording

The helical scan technology employed in the DIR-1000 Series provides extremely high-density data recording. A large D-1 cassette provides up to 96 GBytes (82.3 GBytes when the logical file format is applied) of data storage capacity, which is equivalent to 500 reels of conventional computer magnetic tapes. A medium D-1 cassette offers a maximum storage capacity of 43 GBytes (36 GBytes when the logical file format is applied).

## High-Speed, Variable Data Rates Up To 64 MBytes/sec

The sophisticated tape transport used in the DIR-1000 Series data recorders was primarily designed to achieve recording and reproduction of data at various data rates while maintaining the same tape footprint. The resulting playback compatibility within the DIR-1000 Series offers an important advantage: A given DIR-1000 Series recorder can reproduce recorded data at any rate that the machine supports irrespective of the rate or model on which the data was originally recorded. Data rates for the DIR-1000 Series recorders ranges from the maximum of 64 MBytes/sec to 1 MBytes/sec. The DIR-1000H, DIR-1000, DIR-1000M and DIR-1000L each provide a different combination of discrete data rates within this range, giving users performance and cost flexibility in satisfying their various requirements.

Versatile Remote Control System Interface

DIR-1000 Series recorders are equipped with three different types of communication ports: RS-422/485 (primary port), IEEE-488 (GPIB), and RS-232C.

Built-in Diagnostics

All DIR-1000 Series tape drives incorporate highly sophisticated built-in diagnostics which include Built-in Test functionality. The system is capable of detecting a wide range of both operational and system fault conditions which are logged and then reported both to the front panel and via the host interface.

**DIR-Series Transfer Rate Coverage**

3
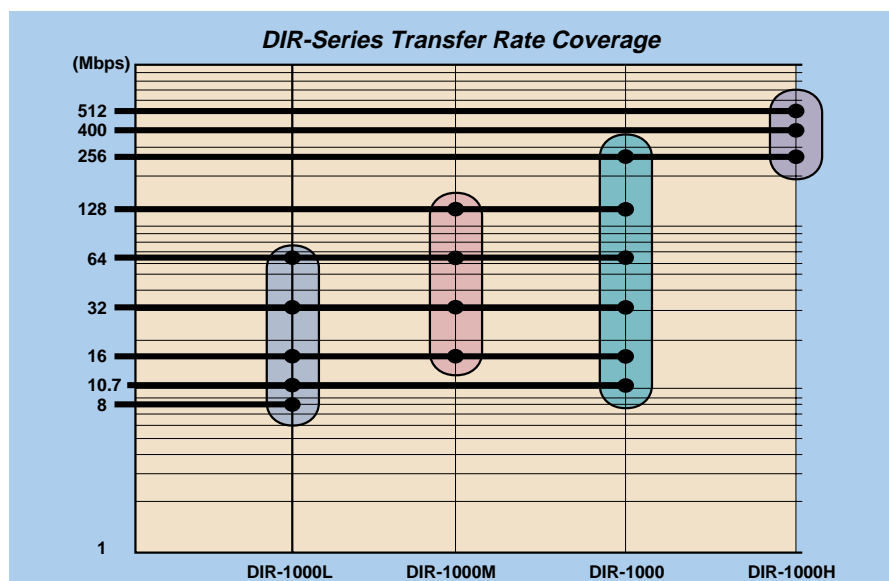
PetaSite™

The DMS-8800 PetaSite Series is designed for the data storage systems from 6.8 Tera Bytes to 3 Peta Bytes. It accommodates the DIR-1000 Series tape drives and SD1 media, offering transfer rates from 64 MBytes/sec to 1 MBytes/sec and capacities up to 96 GBytes/cassette. Each PetaSite is a user-configurable system composed of four basic building blocks.
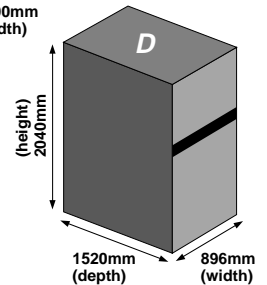
Basic Console (DMS-8800B)
Control, robotic system, casseette input/output ports.
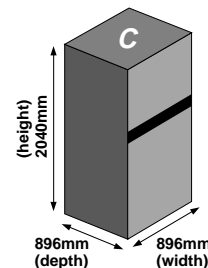Data capacity: 0.6TBytes

B
(height) 2040mm
896mm (depth)   1000mm (width)
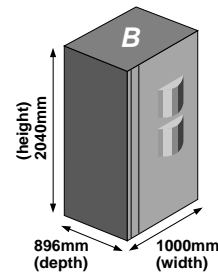
Tape Drive Console (DMS-8800D)
Cassette storage and drive space for 3 DIR-1000 Series tape drives
Data capacity: 6.2TBytes

D
(height) 2040mm
1520mm (depth)   896mm (width)

Cassette Console (DMS-8800C)
Primary storage module: 120 SD1 cassettes
Data capacity: 9.8TBytes

C
(height) 2040mm
896mm (depth)   896mm (width)

Junction Console (DMS-8800J)
Provides flexibility in system layout, robotic system and cassette input/output ports
Data capacity: 0.6TBytes

J
(height) 2040mm
1000mm (width)   896mm (depth)
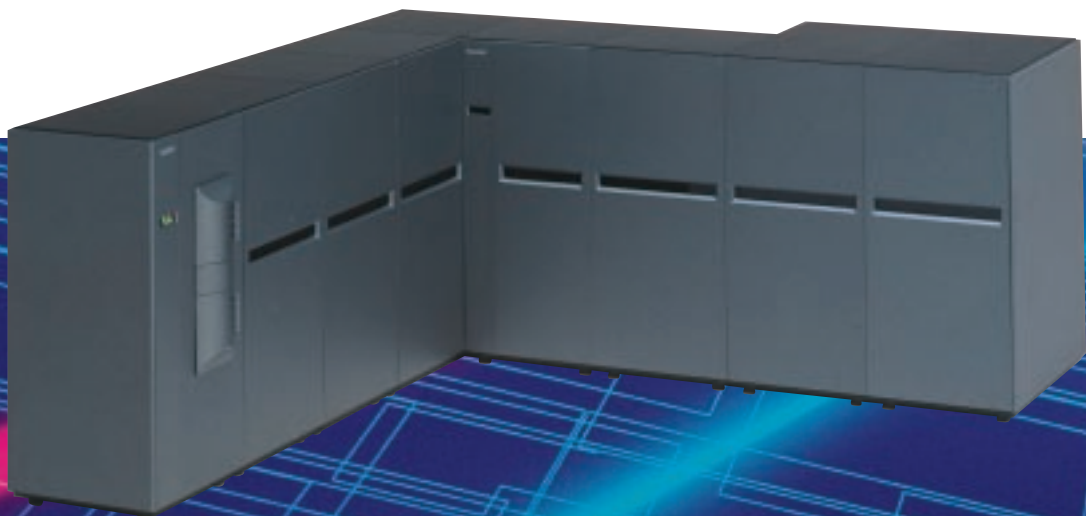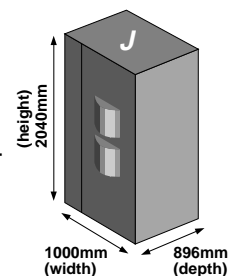
F E A T U R E S

Flexible Layout

The PetaSite concept offers a high degree of flexibility, allowing almost any user-spec-ified configuration of consoles. One Basic Console is needed for each system. The quantities of Drive and Cassette Consoles in the system are based on the required number of tape drives and the desired storage capacity. The quantity and positioning of Junction Consoles are based on the desired direction(s) of cassette transfer and physical layout constraints.

PetaSite accepts 2 size SD1 cassettes.

Example configuration-1:

145.6 TByte capacity, 18 tape drives

1.52m

| B | C | C | C | C | C | D | D | D | D | D | D | C | C | C | C | C | C |

16.23m
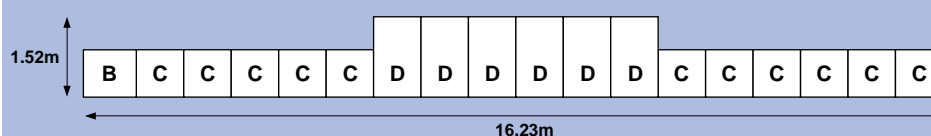
Example configuration-2:

137.0 TByte capacity, 18 tape drives

6.90m

6.51m
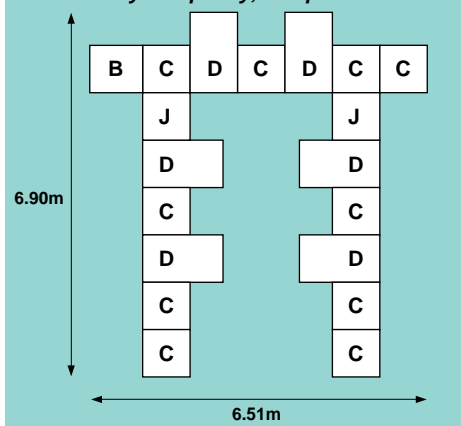
Expandable
 to up to 3 PByte capacity
(uncompressed)

Minimum System

Basic console+1 tape drive console
6.8 TByte capacity (uncompressed)
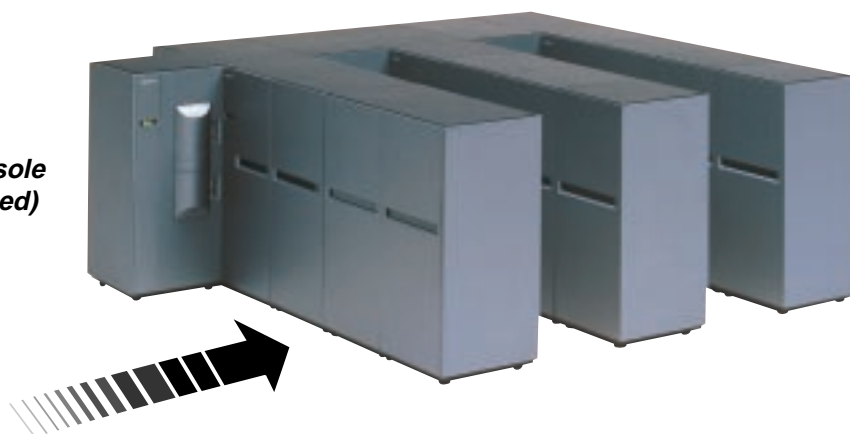
Reliability

PetaSite draws on Sony's many years of experience providing automated tape systems for broadcast, and more recently, instrumentation and computing environments. PetaSite reliability reflects our success in supplying tape robotics of the highest quality.

Optical Elevator Control

Sony's unique system of optical control between the PetaSite Basic Console and the library elevator eliminates conventional wiring and offers higher reliability and mobility of the library arm.

PetaSite Controller Software (PSC)

The Sony PetaSite Control software (PSC) offers ease of integration with the Sony PetaSite tape library. The PSC software is a product designed to run under Windows NT™ on a standard PC (100MHz Pentium, 32MB RAM), allowing users to monitor system and drive utilization via a convenient graphical user interface. Two options are available, SCSI or TCP/IP.

PSC allows monitoring of:

—PetaSite library utilization

—PetaSite drive utilization

—PetaSite drive status

—System logging
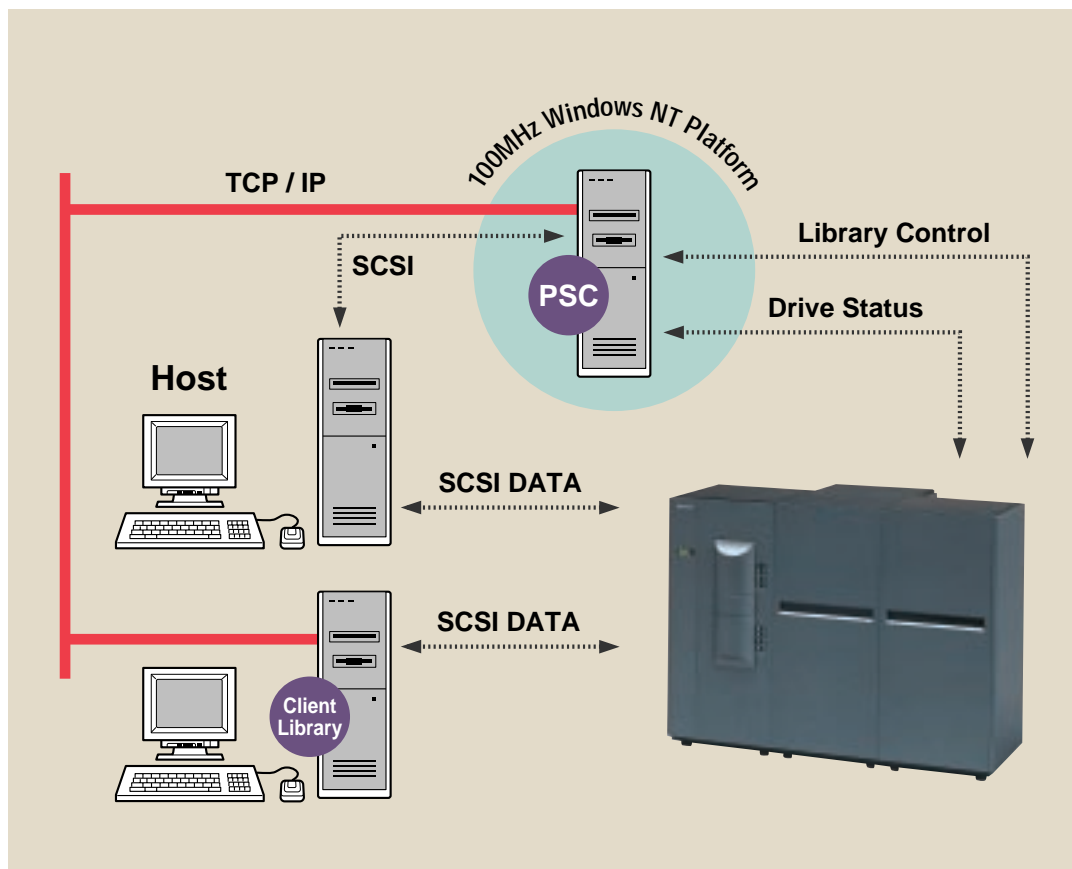
SCSI Option—The PSC SCSI option comprises a PCI-Bus SCSI-2 Adapter, supplied by Sony which allows the PSC server to act as a SCSI target and respond to commands from a SCSI initiator.

It supports the ANSI SCSI-2 specification for media changers and provides volume management functionality via a SCSI-2 interface, independent of the SCSI-2 data path(s) to each drive in the library.

TCP/IP Option—The PSC TCP/IP option comprises a client library which allows an application access to functionality provided by the PSC server over a standard network connection. The client library provides volume management functionality via a comprehensive Application Program Interface (API), independent of the SCSI-2 data path(s) to each drive in the library.
PSC client libraries are available for most UNIX platforms and Windows NT.

Cassette Input/Output

PetaSite offers a unique, fully automated cassette input/output via a "mail box" style mechanism. There is both an upper and a lower input/output port, each of which is capable of accepting four cassettes simultaneously.

Bar Code Management

Again Sony has utilized its proven library management experience to provide a sophisticated, fully automated bar code management system within the PetaSite library.

Drive Diagnostics

The PSC software provides complete drive diagnostic data to the system administrator via a proven graphical user interface.

DMS-24 Versatile Cassette Storage Console

The DMS-24 can be configured to accommodate one tape drive and 24 cassette storage bins or two tape drives and 16 cassette storage bins. In order to provide maximum flexibility, the DMS-24 is designed to accept any DIR-1000 Series machine. Each bin accommodates either one medium or one large cassette or two small cassettes. The highly versatile system can be easily configured to best meet the requirements of individual applications.

F E A T U R E S

High Capacity and High Storage Density

Given the extraordinarily high recording density of the DIR-1000 Series tape drives, the DMS-24 is capable of offering unprecedented levels of capacity within an extremely small area.

	Cassette Capacity	Storage Capacity	Storage Density
DMS-24 w/one recorder	24 Large cassettes	2.3TBytes	3.5TBytes/m^2 320GBytes/f^2
DMS-24 w/two recorder	16 Large cassettes	1.5TBytes	2.3TBytes/m^2 210GBytes/f^2

Bar Code Reader (option)

A bar code reader is built into the cassette handling system for fast, accurate identification of individual cassettes within the system. Information from the bar code reader is available to the host controller via the remote control interface.

Remote Control Interface

Comprehensive remote control of the cassette management and built-in diagnostics and error reporting are made available via a RS-232C or RS-422 interface or SCSI-2(option).
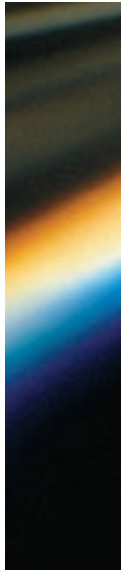
Diagnostic Facility

The DMS-24 employs a comprehensive diagnostic system which is designed to detect an operation error or hardware fault.

Variable Rate Buffer

DFC-1800/1800N

These highly versatile variable rate buffers are suitable for a variety of real-time data acquisition applications. They effectively match the user's data rate with one of the fixed data rates supported by the DIR-1000 Series recorder in use.

I/O Flexibility

The DFC-1800 Series user has the choice of both parallel (8 bit data + clock) and serial bit stream input/output data interfaces.

Buffer Memory

The DFC-1800 Series provides a choice of buffer memory capacity in order to ideally accommodate the range of transfer rates available with the DIR-1000 Series tape drives. The DFC-1800 accommodates user data rates from 0 to 64 MBits/sec when used in conjunction with the DIR-1000L. The DFC-1800N, equipped with a larger buffer memory, accommodates user data rates of up to 256MBits/sec with the DIR-1000. Both models also offer a unique "reverse replay mode" enabling up to 105MBits/sec reverse data replay for some remote sensing applications.

IRIG-A/B Time Code

Both the DFC-1800N and the DFC-1800 accommodate an IRIG-A or IRIG-B time code channel. The time code record is maintained within the helical data tracks and updated incrementally with a precision of ±0.1 millisecond.

Write Retry Function

The DFC-1800 and DFC-1800N provide a Write Retry Function for maximum data assurance. Any media errors detected during recording are re-recorded on a new portion of the tape from the buffer memory in the DFC-1800 Series unit.

Diagnostics

The DFC-1800 and DFC-1800N both incorporate a comprehensive diagnostics and error reporting capability.

Data Recorder Controller
DFC-1500 with SCSI FAST Interface and DFC-1700 with SCSI WIDE Interface

Sony's DFC Series recorder controllers incorporate SCSI interfaces to provide assured connectivity between DIR Series recorders and a wide range of industry-standard workstations and other computer platforms. The interface built into the DFC-1500 model is SCSI-2 Fast. The DFC-1700 interfaces with host computers via SCSI-2 Fast and Wide.

Operational Flexibility

The DFC Series controllers support both synchronous and asynchronous transmission modes for optimum performance in a variety of system configurations. The DFC-1500's maximum data transfer rate in the synchronous mode is 10MBytes/sec; in the asynchronous mode it is 4MBytes/sec. The DFC-1700's maximum transfer rate in synchronous mode is 20MBytes/sec.

Each model accommodates both single-ended and differential SCSI input/output configurations, providing desirable flexibility in meeting application requirements. The differential ports are capable of driving cables up to 25 meters long.

When used in conjunction with a DIR-1000 Series tape drive, both controllers comply with "SCSI-2 Sequential Access Device Model." providing a simple and effective means of connection to the widest range of workstations. Both units can also be used in the raw SCSI mode in conformance with the standard SCSI command set (Group 0-6 byte configuration).

Logical Tape Format

Using the ANSI ID-1 format as the fundamental media format, Sony developed a logical tape format to facilitate file management on tape. Both the DFC-1500 and the DFC -1700 utilize Sony's 19mm logical tape format. This 19mm logical tape format which is available as a user-selectable option embedded into various system interfaces offers several important benefits:

Fig.3 19mm Digital Tape Format
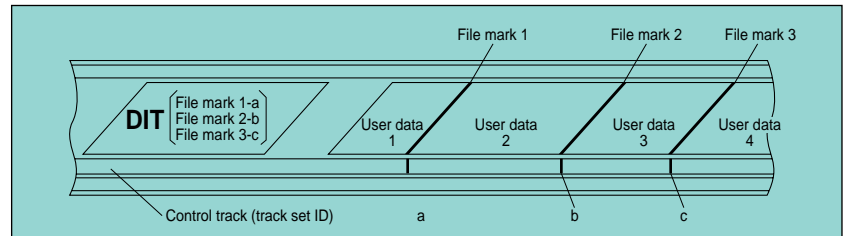
Fast File Access

The 19mm logical tape format provides fast, reliable data access by maintaining a comprehensive Directory Information Table (DIT) at the tape header. Individual user files are identified and located by means of the data stored and maintained in the DIT. Fast access to a desired file on tape at the full search speed of the recorder is achieved by use of ID "Track Set" numbers allocated to each block in accordance with the ANSI ID-1 standard. The DIT is updated with the contents of new files added to the on tape file system each time the tape is unmounted.

Automatic Read/Write Retry

The 19mm logical tape format supports a sophisticated Automatic Read/Write Retry algorithm for maximum data assurance. The reproducing heads are placed so that the recorded data is immediately reproduced during recording. Any media errors that may occur during recording are quickly identified and the data is re-recorded on a new portion of the tape from the buffer memory in the interface. The same algorithm applies in playback mode when soft errors are detected and data is re-read from the tape. For further assurance of data reliability, a Bad Spot table is maintained within the DIT so as to avoid subsequent attempts to read or write on any defective areas of the media.

DIR-1000 Series recorders using the 19mm logical tape format and Sony SDI data cassettes provide a corrected bit error rate of better than 1×10^{-13}.

Buffer Memory

Both units incorporate a solid-state buffer memory which ensures the most efficient use of the DIR-1000 Series recorder by matching the user's data rate with the user-selected data rate of the tape drive. The DFC-1500's buffer memory has a 32MByte capacity. The DFC-1700's buffer memory has a 128MByte capacity.

Variable Data Transfer Rate

The DFC-1500 and DFC-1700 support a range of user-selectable rates for transferring data to DIR-1000L and DIR-1000M recorder, respectively. In this way the DIR-1000 Series system can be easily configured to match the data transfer rate of the host computer and thus provide optimum performance.

Diagnostics

The DFC-1500 and the DFC-1700 both offer a comprehensive diagnostics and error reporting capability.

Sony manufacture the highest quality recording media for use with the DIR-1000 Series tape drives. The broadcast grade D-1 digital video cassette is available in all three shells.Whilst the digital video gradetape may be perfectly adequate for many instrumentation applications, Sony have recognized the need for a superior digital data grade media for the most demanding high speed instrumentation, and computer data applications. The new SD1 Series of Data Media products have been designed specifically to meet the demands of such applications both in the laboratory and in the data center. The new SD1 range boasts improved raw bit error performance and stability. The newly developed binder offers improved friction characteristics maintaining the lowest possible error rate with repeated usage characteristic of computer data storage.The cassette shell too has been designed for additional robustness and better protecion of valuable user data over a wider range of environmental conditions. The SD1 range is currently available in two models, the SD1-600M provides a maximum of 43 GBytes in a medium size cassette shell whilst the large size SD1-1300L provides capacity for up to 96 GBytes of user data (unformatted).

SPECIFICATIONS of DIR-1000 Series

	DIR-1000H	DIR-1000	DIR-1000M	DIR-1000L
PERFORMANCE				
Recorded tape format	ANSI X3.175-1990 ID-1 Standard			
Casette tape	19mm type D-1 Broadcast standard L/M/S sizes 19mm type SD1 data cartridge L/M sizes			
Recording capacity	L-cassette:Max.96GBytes (82.3 GBytes, formatted) M-cassette:Max.43GBytes (36 GBytes, formatted) S-cassette:Max.8.7GBytes (5.2 GBytes, formatted)			
User data rate	64	32	16	8
(MBytes/sec)	50	16	8	4
(Record/reproduction)	32	8	4	2
		4	2	1.3
		2		1
		1.3		
Bit error rate	$1\times10E-10$ (Standerd)			
(Corrected)	$1\times10E-13$ (19mm DTF formatted)			
Data assurance	Read after Write for Data and CTL (Read/Write Retry,19mm DTF formatted)			
Tape loading time	Less than 14 seconds			
Servo lock time	Approx,10s from stop mode Less than 2.5s from standby mode			
Fast forward/ rewind time	Less than 180s with L-cassette Less than 90s with M-cassette Less than 45s with S-cassette			
GENERAL				
Power requirements	100V to 120V/220V to 240V ±10%, 50/60Hz			
Power consumption	650W	550W	450W	400W
Operating temperature	10°C to 35°C (50°F to 95°F)			
Operating humidity	20% to 80% (non-condensing)			
Weight (Approx)	70kg (154 lb 5oz)	67kg (147 lb 11oz)	62kg (136 lb 11oz)	58kg (127 lb 14oz)
Dimension (W × H × D) (Approx)	436 × 432.5 × 633.5mm (17 1/4 × 17 1/8 × 25 1/8 inches) Including handles and feet			
INPUT/OUTPUT SIGNALS (Connecter)				
DATA INPUT (DS25/DS50)	8 line pairs for data (ECL,NRZ) (with clock, sync, parity)			
DATA OUTPUT (DS25/DS50)	8 line pairs for data (ECL, NRZ) (with clock, sync, parity and error flag)			
REF(reference)INPUT(D25S)	clock and sync (ECL)			
ANNOTATION INPUT CH-1/CH-2(XLR 3-pin.female)	+4dBm, 600Ω, balanced			
ANNOTATION OUTPUT CH-1/CH-2(XLR 3-pin.male)	Low impedance, balanced			
MIC IN(Standard jack)	For ANNOTATION CH-1			
HEADPHONE OUT (Standard jack)	For ANNOTATION CH-1			
AUX (auxiliary)DATA INPUT/OUTPUT(D15S)	RS-422 Interface			
REMOTE 1/2 (D25S)	RS-232C interface			
REMOTE 3	IEEE-488 (GPIB) interface			
REMOTE 4/5 (D9S)	RS-422/485C (Primary) interface			

RECORDING TIME/TAPE SPEED

Data rate (MBytes/s)	Recording Time (H:hours, M:minutes)		Tape Speed (mm/s)
	L-size	M-size	
64	25M	10M	847.6
50	32M	14M	662.2
32	50M	20M	423.8
16	1H40M	45M	211.9
8	3H20M	1H30M	105.9
4	6H40M	3H00M	53.0
2	13H30M	6H00M	26.5
1.3	20H20M	9H00M	17.7
1	27H00M	12H00M	13.25

SUPPLIED ACCESSORIES
Rack angel assemblies (2), AC power cord (1)
Plug holder (1), User's manual (1)

OPTIONAL ACCESSORIES

Cables	•VCD-2D/5D/10D/30D (2/5/10/30m) Digital video cable for data input/output signals •ECD-3C/10C/30C (3/10/30m) Digital audio cable for annotation input/output signals •EC-5XLR2/10XLR2 (5/10m) Analog audio cable •RCC-5G/10G/30G (5/10/30m) RS-422/485 Remote control cable •SMK-0032 (2m) IEEE 488 (GPIB) interface cable
Rack mount kit	•RMM-18DV Rack mount rail for use with supplied rack angle assemblies
Tapes	•19mm SD1 data cartridge SD1-1300L (96GBytes) and SD1-600M (43GBytes) •19mm D-1 cassette S-cassette (D1S-6), M-cassette (D1M-12/22/34) and L-cassette (D1L-76/94)

Rear Panel of DIR-1000H/1000/1000M/1000L

Specifications of DMS-8800 Sony Digital Mass Strage System

Maximum data capacity	6.8 TBytes to 3.0 PBytes (uncompressed)
Access time	Tape load—Average 60s Tape transfer—Max 2m/sec
Cassette access	Random or sequential
MCBF	More than 500,000
MTTR	30 minutes
Power sources	AC 100V, 120V, 220V, 240V, 50/60Hz

Specifications of DMS-24

Data storage capacity	2.3 terabytes
Cassette console capacity (D-1/SD1 cassettes)	24 L/M-cassettes or 48 S-cassettes
Tape drive console capacity (Sony DIR-1000 series)	1 or 2
Storage density per square meter (per square foot)	3.5 terabytes (320 gigabytes)
Access time	less than 6 seconds
Power requirements	AC100-120V or AC220-240V, 50/60Hz
Power consumption (without tape drives)	1kVA
Operating temperature	10°C to 30°C (50°F to 86°F)
Operating humidity	25% to 80% (non-condensing)
Weight (without tape drives and cassettes)	300kg (661lb 6oz)
Dimensions (W x H x D)	600 x 1980 x 1090mm (23 5/8 x 78 x 43inches)

Specifications of DMS-8800B/8800D/8800C/8800J

Model name	**Basic Console** **DMS-8800B**	**Tape Drive Console** **DMS-8800D**	**Cassette Console** **DMS-8800C**	**Junction Console** **DMS-8800J**
Functions	Control, robotics system and cassette input/output	Tape drives and cassette storage	Primary cassette storage	Provides flexibilty in system layout
Data capacity:	0.6TBytes	6.2TBytes	9.8TBytes	0.6TBytes
Interface	RS232C	—	—	—
No. of tape drives	—	3 drives	—	—
Mass (Without tapes & drives)	Approx. 400kg (881.85 lbs)	Approx. 450kg (992.08 lbs)	Approx. 310kg (683.43 lbs)	Approx. 430kg (947.99 lbs)
Dimensions (W/H/D):	1000 x 2,040 x 896 mm (39 3/8 x 80 3/8 x 35 3/8 inches)	896 x 2,040 x 1,520 mm (35 3/8 x 80 3/8 x 59 7/8 inches)	896 x 2,040 x 896 mm (35 3/8 x 80 3/8 x 35 3/8 inches)	1000 x 2,040 x 896 mm (39 3/8 x 80 3/8 x 35 3/8 inches)

Specifications of DFC-1500 / DFC-1700

	DFC-1500	DFC-1700
PERFORMANCE		
Interface	SCSI-2 FAST Single-ended/Differential	SCSI-2 WIDE Single-ended/Differential
Data buffer capacity	32MBytes	128MBytes
Data rate (Synchronous mode)	Max:10MBytes	Max:20MBytes
	Continuous transfer rate:7.2MBytes (8MBytes in RAW mode)	Continuous transfer rate:14.4MBytes (16MBytes in RAW mode)
	Asynchronous mode Max.:4MBytes/s	
Bit error rate	1 x 10E-3	1 x 10E-3
Recording capacity	Max.:82.3GMBytes (SD1-1300L, formatted)	Max.:82.3GMBytes (SD1-1300L, formatted)
	Max.:36.0GMBytes (SD1-600L, formatted)	Max.:36.0GMBytes (SD1-600L, formatted)
GENERAL		
Power requirements	AC100V to 120V/220V to 240V ±10%, 50/60Hz	AC100V to 120V/220V to 240V ±10%, 50/60Hz
Power consumption	Approx.100W	Approx.180W
Operating temperature	5°C to 40°C (41°F to 104°F)	5°C to 40°C (41°F to 104°F)
Operating storage humidity	20% to 90% (non-condensing)	20% to 90% (non-condensing)
Weight	Approx.10.5kg (23lb 2oz)	Approx.17kg (37lb 7oz)
Dimensions (W x H x D)	424 x 88 x 422mm (16 3/4 x 3 1/2 x 16 5/8 inches)	424 x 88 x 520mm (16 3/4 x 3 1/2 x 20 1/2 inches)
INPUT/ OUTPUT SIGNALS		
SCSI (Single-ended/Diffential)	50-pin x 2	68-pin x 2
Data input (from DIR)	D-sub 25-pin	D-sub 25-pin
Data output (to DIR)	D-sub 25-pin	D-sub 25-pin
Diagnostic	D-sub 9-pin, RS-232C	D-sub 9-pin, RS-232C
Remote (for DIR)	D-sub 9-pin, RS-422	D-sub 9-pin, RS-422A
SUPPLIED ACCESSORIES		
	Operation manual (1)	Operation manual (1)
	Rack mount angles (2)	Rack mount angles (2)

Rear Panel of DFC1500

Rear Panel of DFC1700

Specifications of DFC-1800/1800N

PERFORMANCE

	DFC-1800	DFC-1800N	
Data recorder	DIR-1000L	DIR-1000M	DIR-1000
User data rate (MBits/s)			
Record / replay	0 to 64	0 to 128	0 to 256
Reverse replay	0 to 25	0 to 72	0 to 105
GENERAL			
Power requirements	100 to 120V/220V to 240V ±10%, 50/60Hz		
Power consumption	Approx.120W		
Operating temperature	10°C to 35°C (50°F to 95°F)		
Operating humidity	20% to 50% (non-condensing)		
Weight	Approx. 12kg (26lb 7oz)		
Dimensions (W x H x D)	424 x 100 x 645mm (16 3/4 x 4 x 25 1/2 inches)		
INPUT/OUTPUT SIGNALS			
Data — Input 1	D-sub 25-pin, 8bit parallel, ECL differential		
Input 2	BNC, bit serial, ECL differential		
Output 1	D-sub 25-pin, 8bit parallel, ECL differential		
Output 2	BNC, bit serial, ECL differential		
Time code — Input 1	BNC, IRIG-A or IRIG B, AC code		
Output 1	BNC, IRIG-A or IRIG B, AC code		
Remote — Remote 1	24pin, GP-IB		
Remote 1	D-sub 25-pin, RS-232C		
For DIR-1000 Series data recorders			
Data input	D-sub 25-pin, 8bit parallel, ECL diffential		
Data output	D-sub 25-pin, 8bit parallel, ECL diffential		
Auxiliary	D-sub 15-pin, RS-422A		
Remote	D-sub 9-pin, RS-422A		
SUPPLIED ACCESSORIES			
VCD-2D, digital data cable (2)			
RCC-5G, RS-422 cable (1)			
D-sub 15-pin cable (1)			

Specifications of SD1-600M/1300L

	SD1-600M	SD1-1300L
Storage capacity	43GBytes	96GBytes
Tape width	19.010mm	
Tape thickness	15.3µm	
Tape length	604m	1330m
Dimensions	254 x 150 x 33mm	366 x 206 x 33mm
Weight (including case)	1.03kg	2.67kg

Rear Panel

Distrubuted by